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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,234	09/24/2003	Toshiharu Seko	1035-469	2043
23117	7590	10/20/2005		
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER ANDUJAR, LEONARDO	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/668,234	Applicant(s) SEKO, TOSHIHARU	
	Examiner Leonardo Andújar	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 8-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/1/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgment

1. The amendment filed on 8/04/2005 in response to the Office action mailed on 5/04/2005 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-16.

Election/Restrictions

2. Applicant's election without traverse of group I (claims 1-7) in the reply filed on 03/18/2005 is acknowledged.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sozansky et al. (US 5,953,814) in view of Papathomas et al. (US 5,656,862).

5. Regarding claims 1, 7, 15 and 16, Sozansky (e.g. fig. 1 and 2) shows a semiconductor device comprising: a solder resist 22, an insulating substrate 10 having an interconnection pattern 26/16; a semiconductor element 12, having a projecting electrode 14, electrically connected to the interconnection pattern via the projecting

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electrode; and a resin fillet 20 for anchoring the semiconductor element on the insulating substrate, the resin fillet being an insulating resin (e.g. Namics U8431L, col. 8/first table). The solder resist coats or covers part of the interconnection pattern but leaves the interconnection pattern exposed in an area that is to be connected to the semiconductor element via the projection electrode (see fig. 2). Also, the insulating resin covers the edge portion of the solder resist.

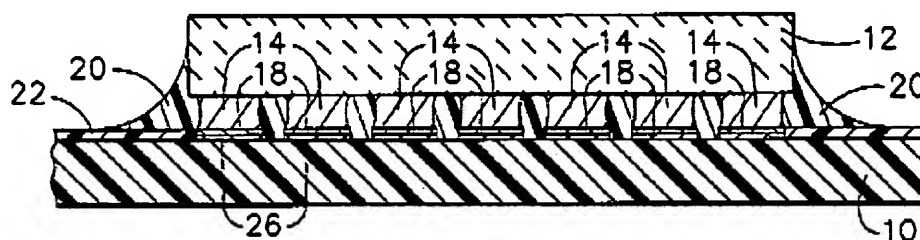
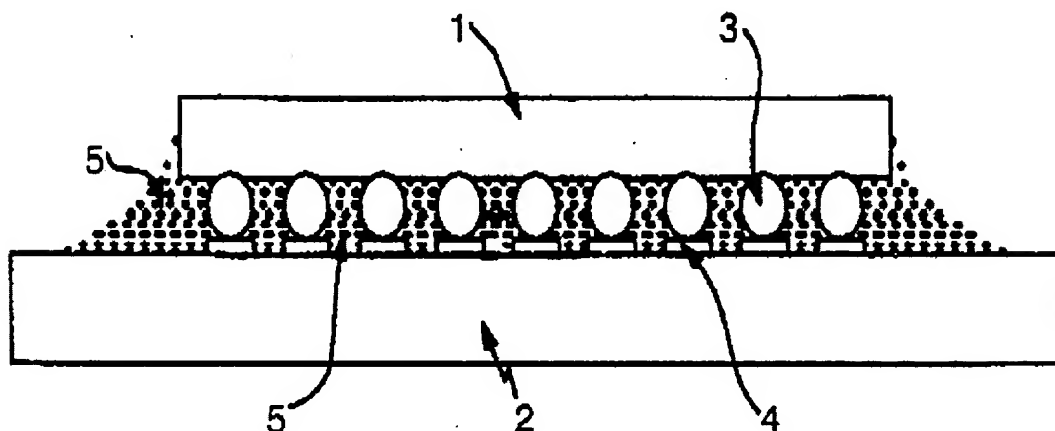


FIG. 1

Sozansky does not disclose that the resin contains at least a resin anti-repellent such as a surfactant. Therefore, Sozansky does not teach that this anti repellent improves/adjusts the wettability of the insulating resin for the interconnection pattern and the insulating substrate. Nevertheless, Papathomas (e.g. fig. 1) disclosed a semiconductor device comprising a resin fillet 5 for anchoring a semiconductor element 1 on an insulating substrate 2. The resin fillet is an insulating resin containing a resin anti-repellent such as a surfactant (col. 4/lls. 1-18 & col. 14/lls. 31-42). Although Papathomas does not explicitly teach that this anti repellent improves and/or adjusts the wettability of the insulating resin for the interconnection pattern and the insulating substrate this limitation is an inherent property of the material (i.e. Triton X-100). Furthermore, this type of resin fillet enhances the fatigue life of the solder

interconnections between the semiconductor device and the supporting substrate (col. 3/lls. 3-41).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the resin fillet disclosed by Sozansky in accordance with Papathomas's invention including a resin anti-repellent such as a surfactant (e.g., Triton X-100) in order to enhance the fatigue life of the solder interconnections between the semiconductor device and the supporting substrate.

6. Regarding claim 2, Papathomas teaches that the anti repellent is a surfactant such as Triton X-100. Papathomas does not explicitly teach that this anti repellent improves the wettability of the insulating resin for the interconnection pattern and the insulating substrate. Nevertheless, this limitation is an inherent property of the material.

7. Regarding claim 3, Papathomas insulating substrate may comprise an insulating tape that is bendable (e.g. polyimide substrate; claim 22).

8. Regarding claim 4, Papathomas teaches that the resin anti-repellent is a surfactant. (e.g. Triton X-100; col. 14/lls. 31-42).

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9. Regarding claim 5, Papathomas teaches that insulating resin is a light curable resin or a thermosetting resin (e.g. epoxy resin col. 4/lls. 1-18 & col. 9/lls. 31-40)

10. Regarding claim 6, Papathomas teaches that the insulating resin contains conductive particles dispersed in the insulating resin (col. 9/lls. 31-40).

Response to Arguments

11. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

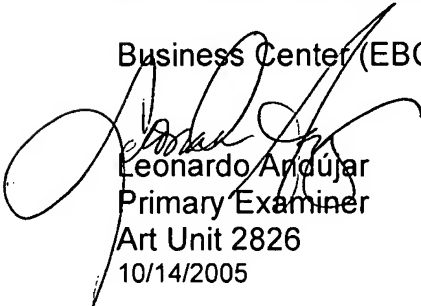
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-

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1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Leonardo Andujar
Primary Examiner
Art Unit 2826
10/14/2005